

Jan. 6, 1970

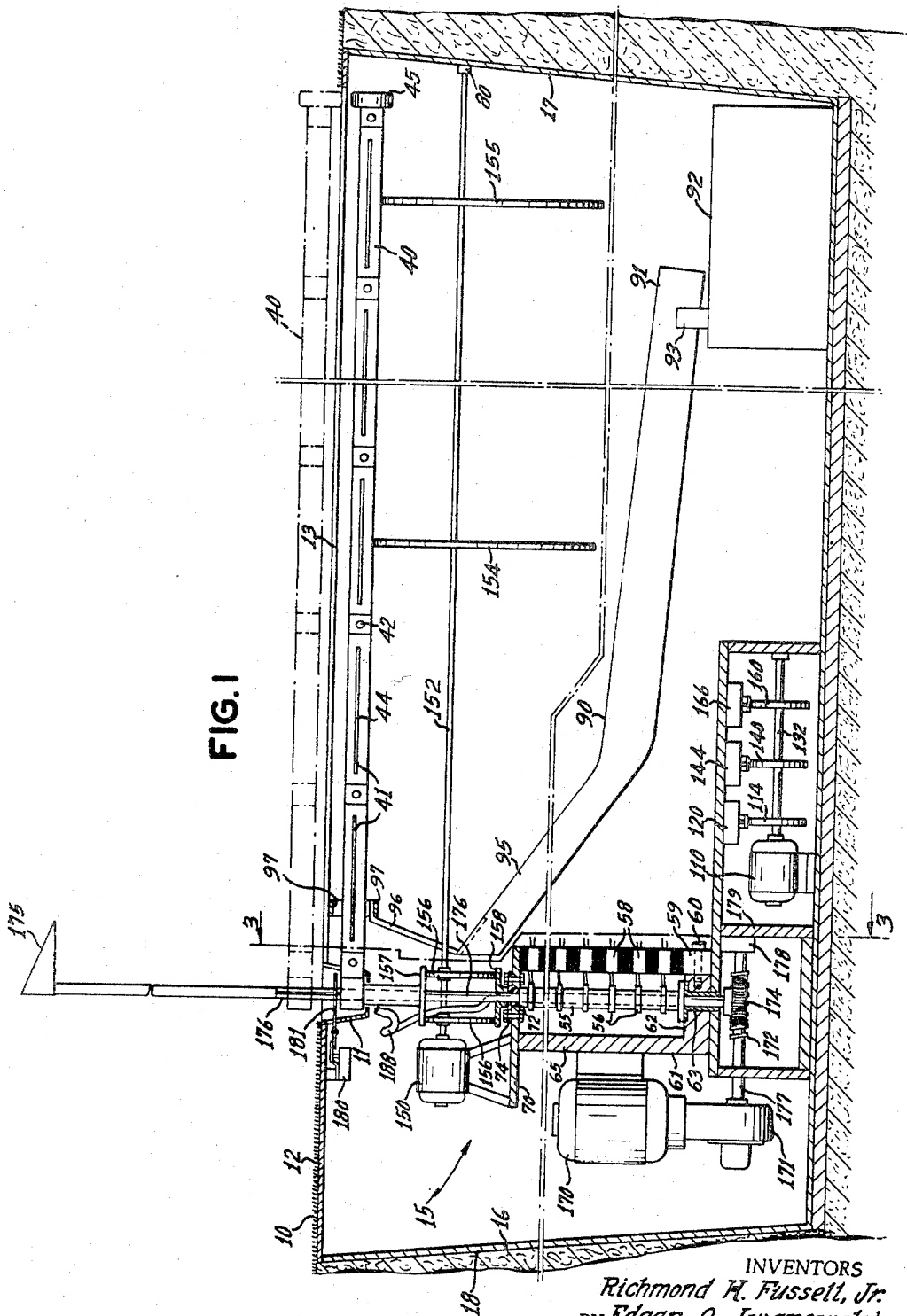
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3,488,057

GOLF BALL SWEEPING AND INDICATING SYSTEM

Filed Dec. 12, 1967

3 Sheets-Sheet 1



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FIG. 3

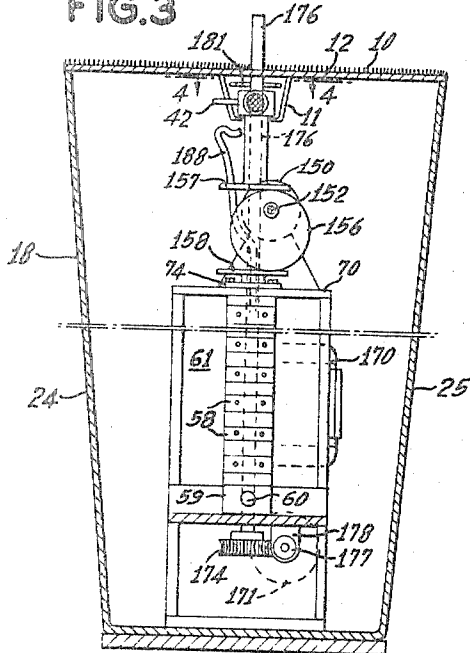


FIG. 4

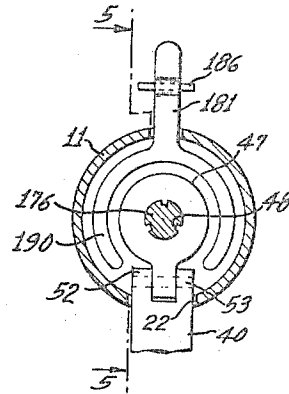


FIG. 5

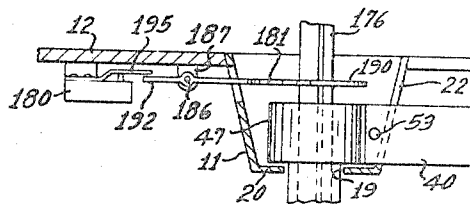


FIG. 6

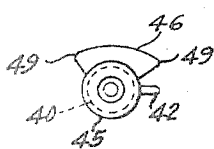
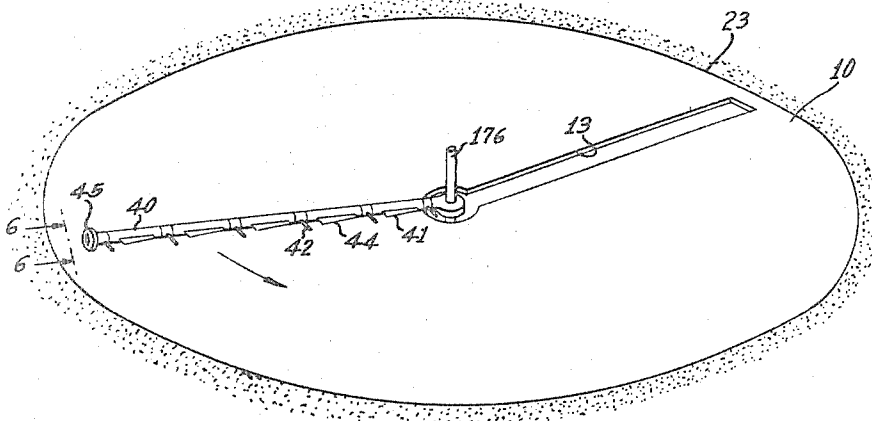


FIG. 2



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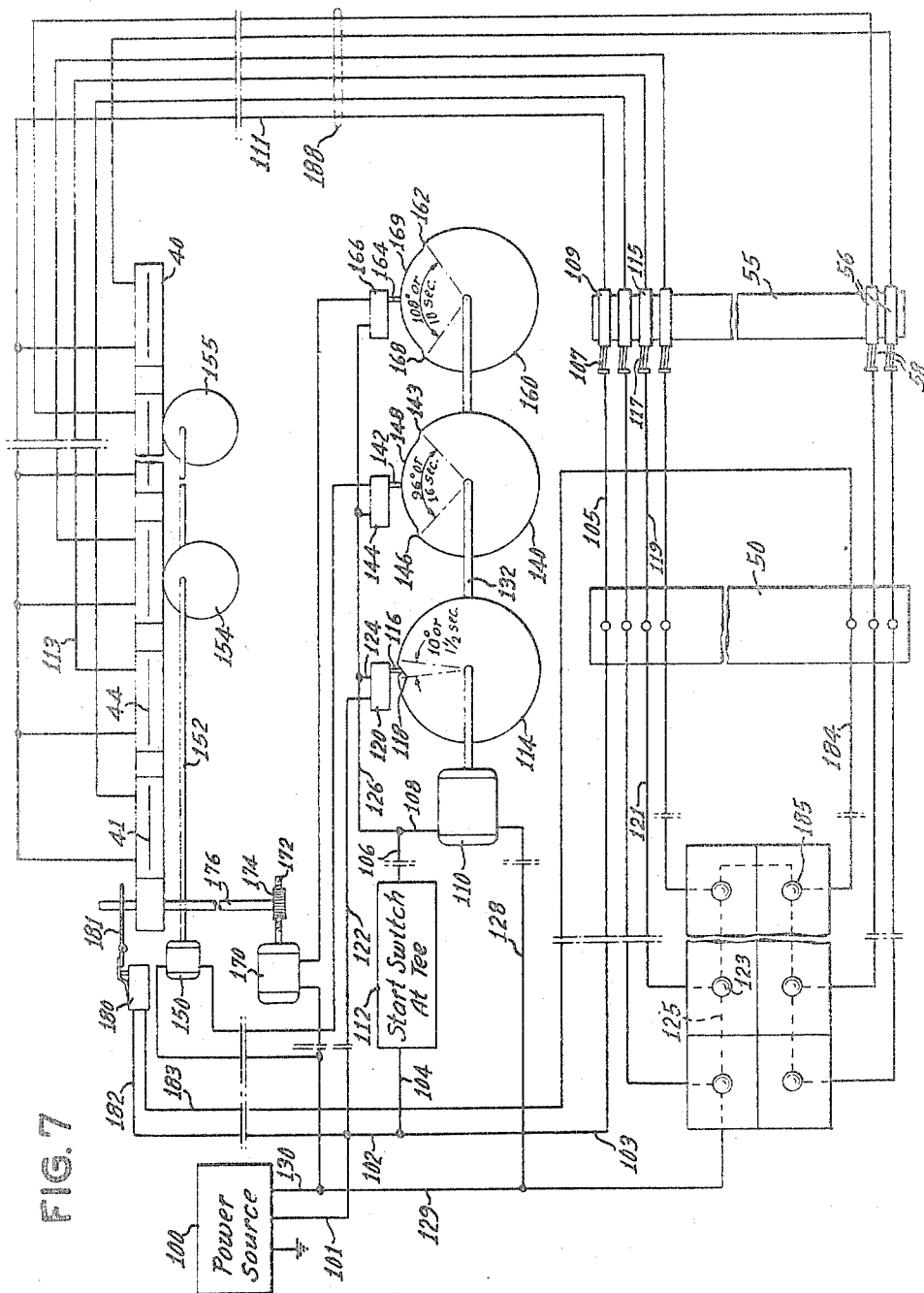
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GOLF BALL SWEEPING AND INDICATING SYSTEM

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FIG. 7



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3,488,057

GOLF BALL SWEEPING AND INDICATING SYSTEM

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U.S. Cl. 273-176

25 Claims

ABSTRACT OF THE DISCLOSURE

A system for sweeping a golf ball from a green and indicating the approximate distance between the golf ball and the cup of the green including an elongated sweep arm having spaced switches therealong, one of which is contacted and closed by the ball as the sweep arm is rotated. The upper surface of the green is provided with an elongated slot through which the ball drops as it is swept by the arm and the arm is selectively raised and lowered through the slot by remote control means operable from the tee by the golfer. Indicator lights are provided at the tee which are responsive to actuation of the switches on the arm. The remote control means also operates the rotation of the arm in time sequence after the arm has been raised through the slot, after which the arm is lowered. The arm is provided with a guard member which closes the slot while the golfer is hitting the ball onto the green and with separating members between adjacent switches so that the ball being swept by the arm only actuates one arm switch. A pivotal connection attaches the arm to an upright shaft for rotation thereabout and a wheel is attached to the arm extremity to support the arm on the green during rotation thereof.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to a golf green system and more particularly to a golf green system for indicating the position of a ball thereon and/or for sweeping the ball thereon from such golf green.

Golfers who play on courses other than regular golf courses and who play various other golf games are concerned with knowing the approximate distances of not only their drives, but more importantly they desire to know the approximate distance of the green between the ball and the cup. In the golf games where the golfer does not walk between the tee and green, some method of informing the golfer of the lie of the ball with respect to the green is important in making such a game attractive to a golfer, keeping the golfer's interest and making the game as realistic to regular play as possible. After knowing the lie of the ball, the ball can be placed in its approximate location on a putting green by the golfer and the golfer then completes the hole by finally sinking his putt.

The present invention is directed to an improved golf green system for use on greens to which the golfer is driving and/or chipping and which accomplish the foregoing and subsequent objectives hereof.

Description of the prior art

There have been many golf games proposed among which are those disclosed by Patents Nos. 1,851,423 and 3,083,021 in which the players hit the balls from tees toward greens spaced outwardly from the tees, the players all driving the balls in the same general direc-

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tion. After the ball is on the green the player, according to Patent No. 1,851,423, places the ball on a putting green disposed rearwardly of the tee in the approximate location of the ball which has come to rest on one of the greens forwardly of the tee. In Patent No. 1,851,423 there are concentric rings which assist the player in determining the distance between the ball and the cup. Patent Nos. 3,129,943 and 3,310,310 disclose green systems employing other means for determining the approximate distance on the green between the ball and the cup. A drive registering system is disclosed in Patent No. 1,869,642.

SUMMARY OF THE INVENTION

This invention relates to a system for indicating the approximate distance on a green between a golf ball and a cup thereof, the system including in one of its aspects an arm mounted on the green adjacent the upper surface thereof for rotation about the cup. Means are provided which are partially carried by the arm for responding to the location of the ball on the green. Power means are connected to the arm and selective means are disposed at the tee readily operable by the golfer for controlling the operation of the power means.

The means partially carried by the arm includes a ball responsive means, in the form of spaced switches, associated with the arm and indicating means, in the form of light indicators, adjacent the tee of the green operatively connected with the ball responsive means for indicating the approximate distance on the green surface between the ball and the cup. Means are also provided between adjacent switches to prevent inadvertent actuation of more than one switch during arm rotation. The arm is pivotally connected to an upright shaft with the pivot axis being laterally of the arm and generally parallel with the arm. Opposite to its pivotal connection is a ground engaging means whereby the arm may generally follow the contour of the upper green surface.

The green also includes means within the cup for responding to the presence of a ball therein and indicator means adjacent the tee for indicating the ball's presence upon actuation by the means within the cup.

In another of the aspects of the invention the green includes an elongated slot generally parallel with the arm in one of its positions through which the ball drops upon rotation of and contact with the arm. Means, in the form of selective power means, are also provided to raise and lower the arm through the slot to position the arm above and below the green surface. A guard member is connected to the arm for closing the slot while the arm is in its lower position below the green surface.

A general object of this invention is to provide an improved golf green ball position indicating system.

Another general object is the provision of an improved golf green ball sweeping system.

An additional general object of this invention is to provide an improved system of sweeping a ball from a green and indicating the approximate distance between the swept ball and the green cup.

A particular object is to provide improved green systems for utilization as a plurality of greens forwardly of the tee, the golfer driving and/or chipping the ball from the tee toward such improved green systems.

Another particular object is the provision of a ball sweeping system to remove the ball from the green onto which the driven or chipped ball lands, particularly wherein the system is operable remotely by the golfer from the tee.

A specific object is to provide an improved ball indicating system for indicating the approximate distance on the green between the ball and the cup, and particularly wherein the indication thereof is adjacent the tee for ready

determination by the golfer and wherein such a system is operable remotely by the golfer from the tee.

Another specific object is the provision of an improved ball indicating system for indicating the approximate distance on the green between the ball and the cup and for indicating the presence of the ball in the cup.

Other objects of the present invention include the simplicity in construction, efficiency in operation, and inexpensive and durable in construction and maintenance costs.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features which are believed to be characteristic of this invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is a side elevational view of the green sweep and distance indicating system in accord with this invention, the arm guard being removed for clarity;

FIG. 2 is a top plan view of the green and the arm sweeping same;

FIG. 3 is a cross-sectional view taken along line 3—3 of FIG. 1;

FIG. 4 is an enlarged cross-sectional view taken along line 4—4 of FIG. 3;

FIG. 5 is a cross-sectional view taken along line 5—5 of FIG. 4;

FIG. 6 is an end elevational view of the sweep arm taken along line 6—6 of FIG. 2 and showing the guard mounted thereto; and

FIG. 7 is a schematic circuit diagram of the components of green sweep and distance indicating system in accord with this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to the drawings of FIGS. 1, 2 and 3 a system of sweeping a golf ball from a green 10 and indicating the approximate distance between the golf ball and the cup 11 of the green 10 is generally designated at 15, the system 15 including a sweep arm 40 mounted laterally of and for rotation about an upright axis or shaft 176 passing through cup 11 with the flag 175 being attached adjacent the shaft upper end. The green 10 includes an upper housing portion in the form of a sheet metal member 12 having synthetic grass like covering thereon to simulate a natural golf green or natural ground and grass covering. An elongated slot 13 is provided through the housing member 12 which has a length and width to accommodate the raising and lowering of arm 40 therethrough as shown by the full line and broken line positions of arm 40 in FIG. 1.

It is to be understood that member 12 need not extend outwardly from the cup 11 in all directions generally equal to the length of arm 40, but should only extend from just forward of the cup 11 back along the slot 13 to the edge 23, member 12 having a width which at least spans between side walls 24 and 25 of housing 18, as seen in FIG. 3. Also, the entire green, including that which overlies member 12 could be natural grass growing in the ground forming the green, although the covering over the guard 46 will be a synthetic material as hereinafter described in connection with FIG. 6.

Arm 40 includes a plurality of switches collectively designated at 41, and between the switches, guide means 42 are provided which direct a ball between adjacent guide means 42 toward one of the switches 41 during rotation of arm 40 for actuation thereof, such guide means preventing other adjacent switches 41 from inadvertent actuation by the one ball during such arm rotation. Arm 40 includes a ground engaging means in the form of a wheel 45 rotatably mounted thereto for supporting the outer extremity of arm 40 on the upper surface of the green, housing member 12, the inner extremity being bifurcated

at 52 and connected by horizontally disposed pin 53 to extension 54 of collar 47 which is slidably mounted by the spline connection 48 to shaft 176, as specifically shown in FIG. 4.

With the arm 40 being pivotal in the vertical direction about pin 53, the arm 40 with its wheel 45 and pivotal attachment permits the arm to generally follow the contour of the terrain over which the arm passes. In this connection it is to be understood that the arm 40 could be made of sections which are connected to each other by a similar bifurcated end on one section and extension on the other adjacent and mating arm section with a pin therethrough identical to pin 53 so that the arm would more closely follow the contour of the ground on the green 10. When such an arm is employed it is to be understood that additional ground engaging means, in the form of wheels, skids or the like, are similarly spaced along and connected to the arm for supporting same on the green surface during rotation of the arm. Also, additional cams, similar to cams 154 and 155, might be provided to adequately support an arm having such plurality of pin connected sections.

Arm 40 is raisable and lowerable by actuation of motor 150 powering shaft 152 to actuate cams 154 and 155 which engage the arm at spaced locations remote from shaft 176. A pair of cams 156 are spaced on either side of shaft 176 and are rotatably connected with shaft 152. Upon 180° rotation of shaft 152, cams 156 operate on cam follower 157 to raise arm 40 to its broken line position, follower 157 being connected to arm 40 and slidable on spline connection 48. Thereafter operation of the motor 150 rotates shaft 152 another 180° and causes cams 156 to forcibly engage cam follower 158 to lower arm 40 from its broken line position into its full line position, follower 158 also being splinedly connected to shaft 176 for rotation with arm 40.

Collector ring assembly 55 surrounds shaft 176 and is keyed thereto for rotation therewith. Associated with each of the collector rings designated 56 are respective brushes 58 which are mounted in a brush holder assembly 59, assembly 59 being attached by bolts 60 to frame member 61. Frame 61 includes a horizontal leg portion 62 through which shaft 176 extends and a thrust and journal bearing 63 is provided for shaft 176 adjacently above bevel pinion gear 174. Motor 170 is affixed to member 61 on its upright leg portion 65 and is operatively connected to a gear reduction box 171 which in turn drives worm gear 172 affixed to shaft 177, shaft 177 having its end portion opposite gear reduction box 171 journaled at 178 which is affixed to frame member 179.

Motor 150 is mounted to horizontal support member 70 which is connected to vertical support portion 65 of member 61, and a journal 72 is provided in member 70 through which shaft 176 extends. A plate 74 is attached to member 70 adjacently around shaft 176 on which cam follower 158 rests while the arm 40 is in its down position as shown in full lines in FIG. 1. The shaft 152 is driven by motor 150 and extends generally throughout the length of the arm 40, so that spaced cams 154 and 155 may support same. Shaft 152 is journaled at 80 to an upstanding wall portion 17 which constitutes a portion of the housing 18 for the assembly 15, wall portion 17 being opposite to wall portion 16. The housing 18 could be made to be waterproof in a manner known in the art, or a sump pump could be included to dissipate water which collects therein, or a water sump could be included below the level of the equipment so that the water therein might be collected and dissipated before reaching a level which could damage the components of the assembly.

An upwardly facing and open, U-shaped channel or collector trough 90 is provided below and along slot 13 so that the ball as it is swept by arm 40 will drop through slot 13 and onto trough 90, trough 90 by gravity permitting the ball to roll into the ball collector 92 positioned at its lower end 91 of trough 90. End portion 91

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of collector 90 is supported by bracket 93 with the upper end 95 being supported by brackets 96 spaced on either side of the upwardly facing U-shaped trough 90 and on either side of slot 13. Brackets 96 are connected by support members 97 which are supported by the upper housing sheet member 12. It is to be understood that the balls from the trough 90 could be returned to the tee or the clubhouse through a series of underground collector tubes without departing from the invention described herein.

A ball cup 11 has an opening 19 in the bottom 20 thereof for the passage of shaft 176 therethrough together with the upper portion of cam follower 157 and the electrical cable 188 for the switches 41 of arm 40. The cup 11 also includes a slot 22 so that arm 40 may slide therethrough between its broken line and full line positions shown in FIG. 1, as is more clearly indicated in FIGS. 4 and 5. The hole-in-one switch 180 is mounted to and beneath member 12 and an actuating lever arm 181 is pivotally mounted at 186 to support member 187 which is mounted to member 12. Lever 181 includes a yoke 190 which surrounds shafts 176 and collar 47, as clearly depicted in FIG. 4. When a ball is hit into cup 11 the ball will depress lever 181 by the ball contacting the yoke portion 190 thereby pivoting the opposite end portion 192 of lever 181 into contact with switch lever 195 which closes switch 180 and thereby actuated light 185, as hereinafter more fully described.

As seen in FIG. 6 arm 40 has a guard 46 attached thereto which conforms to and closes slot 13 when the arm is in its down position, the guard being shown removed in all of the figures except FIG. 6. Preferably edges 49 of the guard are co-planar with the upper surface of member 12, it being assumed that guard 46 also has the grass-like covering thereover. The guard between the edges 49 is domed or extends upwardly in a rounded fashion so that a ball being hit onto the green 10 will not come to rest thereon.

While the green 10 is showing as being at ground level, it is to be understood that the terrain level adjacent the front of the green is preferably at the level of the upper housing member 12; however, the far end of the green may be below or above ground level depending upon the terrain. Of course access to the assembly 15 could be obtained through a trap door in upper housing member 12 and/or through a side wall of the housing unless all of the side walls are below ground level.

Referring now more particularly to the electrical circuit of FIG. 7, the power source 100 supplies current through lines 101, 102, 104, 106 and 108 to timing motor 110 upon actuation of the start switch 112 located at the tee which the player momentarily depresses when it is desired to determine the approximate distance of the ball on the green from the pin or cup 11. Timing motor 110 begins rotating shaft 132 in one direction thereby rotating cam 114 such that the follower 116 is raised from the depression 118 to actuate normally-off switch 120. Actuation of switch 120 maintains current flow from power source 100 through lines 101 and 122, through switch 120 and line 124, through lines 126 and 108 into motor 110 and back through lines 128, 129 and 130, thereby completing the circuit to and from power source 100. The start switch 112 merely momentarily connects timing motor 110 to the power source 100 and thereafter switch 120 connects the power source 100 to timing motor 110, so that upon a complete revolution of cam 114 and of the timing motor shaft 132, the switch 120 will be deactivated by follower 116 falling back into depression 118 thereby disconnecting power source 100 from motor 110. At the time switch 120 is activated, current is supplied through normally-on switch 144 and through appropriate lines to the raise and lower motor 150 whereupon shaft 152 rotates to rotate the cams attached thereto, including cams 154 and 155 to raise the arm 40 from its inoperative position below the upper surface of the green to a position thereabove. When cams 154 and 155

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are rotated 180°, motor 150 is de-activated by the opening of switch 144 when follower 142 is raised by shoulder 143 of cam 140. Thereafter, cam 160 rotates to a position to dispose shoulder 162 liftingly below follower 164 to close the normally-off switch 166 thereby connecting power source 100 with the sweep arm motor 170 which drives a worm gear 172 (after speed reduction) which in turn drives bevel pinion gear 174 for rotating the upright shaft 176 to which the sweep arm 40 is connected. After arm 40 is rotated 360° and cam 160 rotates so that follower 164 drops from shoulder 168 and into cam depression 169 to open switch 166, motor 170 is disconnected from the power source 100 and the arm 40 can then be lowered. Follower 142, upon continued rotation of shaft 132, drops from shoulder 146 and into cam depression 148 to close switch 144 thereby again activating motor 150 which drives the shaft 152 and its attached cams 154 and 155 another 180° thereby to lower the arm 40 down the upright shaft 176, as previously described in connection with FIG. 1.

As the sweep arm 40 rotates on the green a golf ball located adjacent one of the switches 41 is contacted to close the switch thereby connecting power source 100 through lines 101, 102 and 103 to junction box 50 through line 105 to stationary brush 107 which contacts the rotating collector ring 109, collector ring 109 being connected to all of the switches 41 by common line 111. The other side of each of the switches, for example, switch 44 is connected by line 113, collector ring 115, brush 117, line 119 to junction box 50 and then by line 121 to one side of the light 123, the other side of the light being connected by common line 125 and lines 129 and 130 to power source 100 thereby actuating light 123 when switch 44 is actuated upon being contacted by a golf ball on the green which is encountered by the arm 40 during its rotation about the pin. Light 123 will indicate that the ball is approximately 2 feet away from the pin since the switches 41 are spaced each from the next to indicate that the ball is 1, 2, 3, 4, etc. feet away from the pin or cup 11. It is to be understood that additional switches may be used in arm 40 to render the same more accurate in its indication of the approximate distance between the ball and the pin or cup 11 by making the switch levers shorter, moving the switches closer together and adding additional guide pins and switches, for example, every six inches rather than every foot might be indicated by the system.

The lights including light 123, might be numbered directly on the bulbs or a transparent panel and/or numerals could be incorporated in front of the bulbs to indicate the approximate distance between the pin and the ball so contacted by arm 40.

A hole in one switch 180 is disposed adjacent the pin and includes its lever 181 mounted within the cup 11 for actuation by a ball dropping therein, switch 180 being normally off and connected to power source 100 by line 182 and 101 with the other side of the switch being connected by lines 183 to junction box 50 and line 184 to the hole in one light 185. Light 185 is connected by common line 125 and lines 129 and 130 to power source 100 thereby completing the circuit from and to power source 100, switch 180 and light 185.

The timing motor 110 is depicted as rated at 1 r.p.m. with the camming times of cams 114, 140 and 160 respectively being approximately 1½ seconds, 16 seconds and 18 seconds. Also, motor 170 through gear reduction box 171 rotates arm 40 in less than one minute. It is to be understood that motor 110, if desired, could be rated at less than or greater than one r.p.m. with corresponding modifications in motor 170 and/or gear reduction box 171 to speed up or slow down the operation of the golf ball sweeping and indicating system without departing from the spirit of this invention.

While only a certain preferred embodiment of this invention has been shown and described by way of illustra-

tion, many modifications will occur to those skilled in the art and it is, therefore, desired that it be understood that it is intended in the appended claims to cover all such modifications as fall within the true spirit and scope of this invention.

What is claimed as new and what it is desired to secure by Letters Patent of the United States is:

1. A golf green comprising a putting surface and a putting cup an arm mounted on the green adjacent said putting surface for rotation about said cup, and means carried by said arm responsive to a golf ball on said surface for producing a signal to indicate the approximate distance between a golf ball on said surface and said cup.

2. The golf green of claim 1 further comprising a tee, power means connected to said arm for rotating same, and selective means disposed at said tee for controlling the operation of said power means.

3. The golf green of claim 1 further comprising a tee, means within said cup for responding to the presence of a ball therein, means adjacent said tee operative by said means within said cup for indicating the ball's presence within said cup.

4. The golf green of claim 1 further comprising a tee, and indicating means adjacent said tee and operatively connected with said ball responsive means for indicating the approximate distance on said green surface between the ball and said cup.

5. The golf green of claim 4 wherein said ball responsive means comprises a plurality of spaced devices mounted on said arm and responsive to a ball on said surface as said arm is being rotated, and said indicating means includes a plurality of indicators respectively connected to said spaced devices to represent the approximate different distances from said cup to said spaced devices.

6. The golf green of claim 5 further comprising means between adjacent ones of said spaced devices for directing a ball into an actuating position with one of said devices during rotation of said arm and preventing other adjacent ones of said devices from inadvertent actuation by the ball during rotation of said arm.

7. The golf green of claim 5 further comprising electrical power means connected to said arm for rotating same, selective means disposed at said tee for controlling the operation of said electrical power means, each of said spaced devices including an electrical switch which is operable upon actuation by a ball upon rotation of said arm, each of said indicators representing predetermined different distances between said cup and said electrical switches said indicators being operative upon operation of said switches.

8. In a system of sweeping a golf ball from a green having a generally horizontal upper surface and ball cup thereon, the improvement comprising an elongated sweep arm mounted on the green for rotation thereof about an upright shaft passing through said cup and disposed closely adjacent said upper surface, said upper surface having an elongated slot therein adapted to pass golf balls therethrough and extending generally radially from said cup, said arm being adapted upon rotation to contact a golf ball on said surface and move the ball around said cup until the ball drops through said slot.

9. In the system of claim 8 further comprising power means connected to said sweep arm for rotating same, and selective means for controlling the operation of said power means.

10. In the system of claim 8 further comprising means carried by said sweep arm responsive to a golf ball on said surface to indicate the location of said ball.

11. In the system of claim 10 further comprising a tee, and indicating means adjacent said tee operatively connected with said ball responsive means for indicating the approximate distance on said green surface between the ball and said cup.

12. In the system of claim 8 further comprising means

for raising and lowering said arm through said slot respectively above and below said upper surface.

13. In the system of claim 8 further comprising a guard member associated with said arm and movable therewith, said guard member providing a closure for said slot thereby preventing the ball from inadvertently dropping therethrough.

14. In the system of claim 11 wherein said ball responsive means comprises a plurality of spaced devices mounted on said arm and responsive to a ball on said surface as said arm is being rotated, and said indicating means includes a plurality of indicators respectively connected to said spaced devices to represent the approximate different distances from said cup to said spaced devices.

15. In the system of claim 14 further comprising means between adjacent ones of said spaced devices for directing a ball into an actuating position with one of said devices during rotation of said arm and preventing other adjacent ones of said devices from inadvertent actuation by the ball during rotation of said arm.

16. In the system of claim 8 wherein said arm includes opposite end portions, pivotal connecting means having an axis generally parallel with said surface and extending laterally of said arm for connecting one of said end portions to said shaft for rotation therewith, surface engaging means adjacent the other of said end portions for supporting said arm above said surface during rotation thereof.

17. In a system of sweeping a golf ball from a green and indicating the approximate distance between the golf ball and the cup of the green wherein said green includes a generally horizontal surface and a ball cup thereon, the improvement comprising an elongated sweep arm mounted on the green for rotation thereof about an upright axis passing through said cup, said sweep arm being disposed closely adjacent said upper surface for engagement with a ball resting on said upper surface, said upper surface having an elongated slot therein adapted to pass golf balls therethrough and extending generally radially from said cup, said arm being adapted upon rotation to contact a golf ball on said surface and move the ball around said cup until the ball drops through said slot, means carried by said arm responsive to a golf ball on said surface to indicate the location of said ball.

18. In the system of claim 17 further comprising means for selectively raising and lowering said arm through said slot respectively above and below said upper surface.

19. In the system of claim 17 further comprising a tee, and indicating means adjacent said tee operatively connected with said ball responsive means for indicating the approximate distance of the ball on said surface from said cup.

20. In the system of claim 17 further comprising a tee, and means within said cup responsive to the presence of a ball therein for indicating same at said tee.

21. In the system of claim 17 wherein said arm includes opposite end portions, an upright shaft along said upright axis, pivotal connecting means having an axis generally parallel with said surface and extending laterally of said arm for connecting one of said end portions to said shaft for rotation therewith, surface engaging means adjacent the other of said end portions for supporting said arm above said surface during rotation thereof.

22. In the system of claim 17 further comprising power means for rotating said sweep arm and selective means remote from said green for controlling the operation of said power means.

23. In the system of claim 22 further comprising another power means for raising and lowering said arm through said slot respectively above and below said upper surface, said selective means being operative to actuate said other power means to raise said arm through

said slot and then to actuate said first mentioned power means to rotate said arm through one cycle beginning and ending above said slot and then to re-actuate said other power means to lower said arm through said slot to dispose said arm below said upper surface, said arm having a guard member extending therealong which generally provides a closure for said slot thereby preventing the ball from inadvertently dropping therethrough except upon being swept therein by said arm.

24. In the system of claim 19 wherein said ball responsive means comprises a plurality of spaced devices mounted on said arm and responsive to a ball on said surface as said arm is being rotated, and said indicating means includes a plurality of indicators respectively connected to said spaced devices to represent the approximate different distances from said cup to said spaced devices.

25. In the system of claim 19 further comprising means between adjacent ones of said spaced devices for directing a ball into an actuating position with one of said devices during rotation of said arm and preventing other adjacent ones of said devices from inadvertent actuation by the ball during rotation of said arm.

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GEORGE J. MARLO, Primary Examiner

U.S. Cl. X.R.

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